

XLVI.—Notes on the Palæozoic Bivalved Entomostraca. No. X.
Entomis and Entomidella. By Prof. T. RUPERT JONES,
F.R.S., F.G.S.

THESE two genera of Palæozoic Bivalved Entomostraca are little known, though comprising several wide-spread species, found in Silurian, Devonian, and Carboniferous strata. To draw attention to these small but well-marked and abundant fossils, by offering a synopsis of their species, will be useful, it is hoped, to palæontologists.

I. ENTOMIS, Jones, 1861.

- Cypridina*, De Koninck, 1841. Mém. Acad. R. Sc. Belg. vol. xiv. p. 18; 1844. Descr. Anim. foss. Terr. Carb. Belg. p. 587.
Cypridina, G. Sandberger, 1842. Leonh. u. Bronn's Jahrb. f. 1842, p. 226; 1845. Jahrb. Ver. Nat. Nassau, Heft ii. p. 121; G. & F. Sandberger, Verst. Rhein. Sch. Nassau, p. 4.
Cypridina, F. A. Römer, 1854. Palæontographica, vol. iii.; Beitr. Harzgeb. pp. 19, 28, 42.
Cypridina, Richter, 1856. Denksch. math.-nat. Cl. k. Akad. Wien, vol. xi.; Beitr. Paläont. Thür. Waldes, p. 35.
Entomis, Jones, 1861. Mem. Geol. Surv. Gt. Brit., Geol. Edinburgh (Map 32), p. 137.
Entomis, Jones & Kirkby, 1863. Geologist, vi. p. 460; 1864. Rep. Brit. Assoc. Newcastle, 1863, Trans. Sect. p. 80; Neues Jahrb. f. 1864, p. 54; Canad. Nat. Geol. n. s. vol. i. p. 237.
Entomis, Bigsby, 1868. Thesaurus Siluricus, p. 74.
Entomis, Jones, 1869. Palæoz. Biv. Entom. (Geol. Assoc.), pp. 2 & 5; 1870. Month. Microsc. Journ. vol. iv. pp. 185, 187.
Entomis, Barrande, 1872. Crust. Poiss. Sil. Bohême (Extrait &c.), p. 41; Syst. Sil. Bohême, vol. i., Suppl. p. 513.

Entomis is a bivalved Entomostracoon of uncertain alliance. It has an ovato-oblong, bean-like carapace. The valves are strongly indented by a transverse furrow, which begins on the dorsal margin, at about one third of its length from the anterior extremity, and reaches halfway or more across the valve. This is the usual place of the dorsal or nuchal sulcus in several Palæozoic Ostracoda, as:—*Aristozoe*, Barrande; *Orozoe*, Barr.; *Cypridella*, De Koninck; *Cyprella*, De Kon.; *Primitia*, Jones & Holl; *Isochilina*, Jones; *Leperditia*, Rouault; *Beyrichia*, M'Coy; and *Hippa*, Barr.

The surface of each valve sometimes presents in front of the sulcus a rounded tubercle: but this is variable in position and shape; sometimes it is a spine, sometimes it is wanting.

The anterior margin is not indented by any sinus or notch, and is therefore without beak or hood.

In *Entomis tuberosa* a radiate muscle-spot, in connexion with the tubercle, is shown on casts in Silurian mudstone from

the Pentland Hills, Scotland (Messrs. Haswell and Brown's Collections).

The surface of the valves in some species is ornamented with delicate riblets, transverse, longitudinal, or concentric.

As far as the shape of the carapace is concerned, *Entomis* stands in the same relation to *Cypridella* of De Koninck as *Polycope* of Sars to *Cypridina* of Milne-Edwards, the anterior notch having disappeared in both *Polycope* and *Entomis*. The animals, however, may have respectively differed very much; for *Polycope* and *Cypridina* belong to different families, and the deep nuchal furrow in *Entomis*, far more impressed than in *Cypridella*, was probably in direct relation with the structure of its internal organs, under modifications not present in other genera.

The physiological meaning of the nuchal furrow in these Entomostraca is not understood. It is faintly indicated in *Philomedes* and *Halocypris*; it is stronger in *Pleopsis* and *Daphnella*, belonging to quite another group of Entomostraca.

The known *Entomides* are:—

1. *Entomis concentrica* (De Koninck), 1841.

Cypridina concentrica. De Kon. 1841. Mém. Acad. Roy. Belg. vol. xiv. p. 18, f. 10; 1844. Desc. Anim. foss. Terr. Carb. Belg. p. 587, pl. 52. figs. 4, 5.

Cythere concentrica, Dupont, 1863. Bull. Acad. R. Sc. Belg. ser. 2, vol. xv. p. 110.

Entomis concentrica, Jones & Kirkby, 1864. Neues Jahrb. für 1864, p. 54; Canad. Nat. Geol. n. s. vol. i. p. 237.

Lower Carboniferous: Belgium.

2. *Entomis serratostrata* (G. Sandberger), 1842.

Cypridina serratostrata, G. Sandberger, Leonh. u. Bronn's Jahrb. 1842, p. 226; Jahrb. Ver. Nat. Nassau, Heft ii. 1845, p. 121, pl. 1. fig. 6; G. & F. Sandberger, Verstein. Rhein. Schicht. Nassau, 1850, p. 4, pl. 1. fig. 2. From the Cypridinen-Schiefer of Nassau.

Cypridina serratostrata, F. A. Römer, 1854. Palæontogr. iii. Beitr. geol. Kennt. nordw. Harzgeb. p. 42, pl. 6. fig. 15. From the Cypridinen-Schiefer of the Harz.

Cypridina? *serratostrata*, Jones, in Morris's Catal. Brit. Foss. 1854, p. 104. Devonshire?

Cypridina serratostrata, Richter, 1856. Denkschr. Akad. Wien, vol. xi., Beitr. Pal. Thür. Waldes, p. 35, pl. 2. figs. 20–29. Thuringia.

Cypridina serratostrata, Ferd. Römer, 1856. In Bronn's Leth. Geogn. 3rd edit. vol. i. p. 532 (not including the synonyms). Germany.

"*Entomis* of the Cypridinen-Schiefer," Jones & Kirkby, 1863. Geologist, vi. p. 460; 1864. Rep. Brit. Assoc. Newcastle, 1863, Trans. Sect. p. 80.

Devonian: Europe; England (*vide* Ferd. Römer & Godwin-Austen*).

* Quart. Journ. Geol. Soc. vol. xiii. p. lxxxix.

3. *Entomis nitida* (F. A. Römer), 1854.

Cypridina nitida, F. A. Römer, 1854. Palæontographica, vol. iii.;
Beiträge Harzgebirge, p. 28, pl. 4. fig. 20.

Goniatite Limestone of the Harz.

4. *Entomis fragilis* (F. A. Römer), 1854.

Cypridina fragilis, F. A. Römer, 1854. Palæontogr. vol. iii.; Beiträge
Harzgebirge, p. 19, pl. 3. fig. 31.

Weissenbach Schists of the Harz.

5. *Entomis globulus* (Richter), 1856.

Cypridina globulus, Richter, 1856. Denkschr. Akad. Wien, vol. xi.;
Beitr. Pal. Thür. Waldes, p. 36, pl. 2. figs. 30-32.

Cypridinen-Schiefer, Thuringia.

6. *Entomis gyrata** (Richter), 1856.

Cypridina gyrata, Richter, 1856. *Ibid.* figs. 33, 34.

Cypridinen-Schiefer, Thuringia.

7. *Entomis tæniata* (Richter), 1856.

Cypridina tæniata, Richter, 1856. *Ibid.* fig. 35.

Cypridinen-Schiefer, Thuringia.

8. *Entomis tuberosa*, Jones, 1861.

Entomis tuberosa, Jones, 1861. Mem. Geol. Surv. Gt. Brit., Neighb.
Edinburgh (Map 32), p. 137, pl. 2. fig. 5.

Upper Silurian: Aymestry, and Bow Bridge, near Ludlow,
Shropshire; Pentland Hills, Scotland; Yarra Lumla, New
South Wales.

9. *Entomis impendens*, Haswell, 1865.

Entomis impendens, Haswell, 1865. Silur. Form. Pentland Hills, p. 38,
pl. 3. fig. 11.

Upper Silurian: Pentland Hills, Scotland.

10. *Entomis biconcentrica*, Jones, 1870.

Entomis biconcentrica, Jones, 1870. Month. Microsc. Journ. vol. iv.
p. 185, pl. 61. fig. 13.

Lower Carboniferous: England; Ireland.

* Illustrated by a so-called "back view" of the carapace. This and other "back views" of carapaces among Dr. Richter's figures are not clear to me; and I wait for a fuller description of these species. Figs. 36-38 illustrate a very curious form, "*Cypridina calcarata*" (p. 37), which, possibly a link between *Cypridina* and *Entomis*, requires further examination.

11. *Entomis aciculata*, Jones, MS. 1871.

Entomis aciculata, Jones, MS. 1871 (Mr. D. J. Brown's Collection. See Rep. Brit. Assoc. Edinburgh, 1871, Trans. Sect. p. 93).

Upper Silurian : Pentland Hills, Scotland.

12. *Entomis dimidiata*, Barrande, 1872.

Entomis dimidiata, Barrande, 1872. Crust. Poiss. Sil. Bohême (Extrait &c.), p. 41; Syst. Sil. Bohême, vol. i., Suppl. p. 513, pl. 24. figs. 7-9.

Upper Silurian; Stages III. E e 2, F f 2, G g 1 : Bohemia.

13. *Entomis migrans*, Barr. 1872.

Entomis migrans, Barr. 1872. *Ibid.* p. 514, pl. 24. figs. 10-14, & pl. 27. fig. 22.

Upper Silurian; Colony in Dd 5, and Ee 1, Ee 2 : Bohemia.

14. *Entomis pelagica*, Barr. 1872.

Entomis pelagica, Barr. 1872. *Ibid.* p. 515, pl. 24. figs. 1-6.

Upper Silurian; Stage Ff 2 : Bohemia.

15. *Entomis rara*, Barr. 1872.

Entomis rara, Barr. 1872. *Ibid.* p. 516, pl. 25. figs. 23, 24.

Lower Silurian; Stage Dd 5 : Bohemia.

In the Carboniferous Limestone of Belgium *Entomis concentrica* (De Koninck) is a characteristic fossil. In the same great geological formation in the British Islands four species have been met with by Mr. Joseph Wright, F.G.S., and Mr. J. H. Burrow, M.A. *Entomis biconcentrica* from Little Island, Cork, Ireland, has been already noticed; another, *E. obscura*, Jones & Kirkby MS., from the same locality and from the North of England, and two from Settle in Yorkshire, *E. Burrovii* and *E. Koninckiana*, J. & K. MS., have yet to be described.

II. ENTOMIDELLA, gen. nov.

In 1861 the genus *Entomis* was intended to include *E. divisa*, in which the nuchal furrow, altogether crossing the valves, divides off the anterior moiety. But it is now proposed to make a distinct generic group, ENTOMIDELLA, for *E. divisa* and *E. buprestis*, in which the furrow is continued across the valve, and no tubercle is present.

1. *Entomidella divisa*, Jones.

Entomis divisa, Jones, 1861. Mem. Geol. Surv. Gt. Brit., Edinburgh

(Map 32), p. 137; 1870. Month. Microsc. Journ. vol. iv. p. 185, pl. 61. fig. 12.

Upper Silurian: Builth and Ludford.

2. *Entomidella buprestis* (Salter).

Leperditia buprestis, Salter, 1866. Rep. Brit. Assoc. p. 285.

Leperditia ? punctatissima, Salter, Siluria, 1867, Appendix, p. 519.

Entomis buprestis, Jones, 1872. Quart. Journ. Geol. Soc. vol. xxviii. p. 183, pl. 5. fig. 15.

Menevian: St. David's, Wales.

On account of their extremely developed nuchal furrow, *Entomis* and *Entomidella* stand apart from the other known Ostracoda, recent and fossil, and may be grouped in a family as ENTOMIDIDÆ.

In an undescribed bivalved Entomostrakon (*Sulcuna*, gen. nov., with two species, from the Carboniferous Limestone of Cork, Ireland) the nuchal sulcus, passing very obliquely downwards and forwards, is so well defined as to cut off the antero-dorsal region of each valve, and raises it into a hump or a sharp process, pointing upwards and backwards. This genus, however, cannot be allied to *Entomis*; for it presents evidence of the Cypridinal notch on the anterior margin, and is far more closely related to *Cypridella*.

XLVII.—*Contribution to our Knowledge of Ceratophrys and Megalophrys.* By Dr. ALBERT GÜNTHER, F.R.S.

Ceratophrys Fryi.

No bony dorsal shield. Skin densely covered with small tubercles unequal in size; the two dorsal lines of tubercles, which are so conspicuous in *C. Boiei*, are absent on the anterior and middle portions of the back, but represented by two short series commencing in the sacral region and converging into a point above the vent. Supraciliary horn long and pointed. The upperside of the head deeply concave, bordered on each side by a blunt-edged ridge terminating on the occiput, and in front by a rough prominent crest running from the eye to the nostril. Tympanum not visible. The vomerine teeth stand on a rather long transverse ridge slightly interrupted in the middle, between the choanæ. Tongue much smaller than in *C. Boiei*, not covering the bottom of the buccal cavity. Digits rather long, with the tubercles on the lower side much developed; carpus with three ovate flattish tubercles, the middle of which is a little larger than the outer. Metatarsal tubercle long, as